

CLAIMS

What is claimed is:

1. A device for producing at least one scored line in at least one plastic material outer layer (12) of a film (10), comprising:
 - a bearing surface (21; 53; 73) for the film (10); and
 - at least one projection (26a, 26b; 52a, 52b; 72a) for forming the scored line by penetration of the projection into the said plastic material layer (12) when the film (10) is in position against the said bearing surface.
2. The device according to Claim 1, in which the projection is arranged on a support (22; 51a, 51b; 71a, 71b), the scored line being formed by relative travel of the film (10) with respect to the support.
3. The device according to Claim 1 or 2, in which the projection (26a, 26b) is capable of incising the plastic material layer.
4. The device according to any one of Claims 1 to 3, in which the projection (52a, 52b; 72a) causes the plastic material of the said layer (12) to flow along the scored line in order to form a bead (55; 75) on the said layer (12) along at least one side of the scored line.
5. The device according to Claim 4, in which the projection (52a; 72a) has an asymmetrical cross section.
6. The device according to Claim 4 or 5, in which the projection causes the formation of a bead (55; 75) on the surface of the said plastic material layer (12) along just one side of the scored line.
7. The device according to any one of Claims 4 to 6, in which the projection (52a, 52b; 72a) causes the plastic material of the said layer (12) to flow along the scored line in order to form a bead (55; 75) on the said layer (12) along each side of the scored line, the

projection causing more plastic material to be flowed along one side of the scored line than along the other side of the scored line.

8. The device according to any one of Claims 4 to 7, in which the projection (52a, 52b; 72a) causes the plastic material to flow in cooperation with ultrasound.
9. The device according to Claim 8, comprising:
 - an anvil (51a, 51b; 71a, 71b), and
 - a sonotrode (50) for applying ultrasound vibrations to the film (10) when the film is compressed between the sonotrode and the anvil,in which the projection (52a, 52b; 72a) is arranged on said anvil.
10. The device according to Claim 9, in which the bearing surface is arranged on the anvil.
11. The device according to Claim 9 or 10, in which the anvil is a wheel (52a; 52b) mounted so as to rotate, the projection forming a rib (51a, 51b) arranged on the circumference of the wheel, the rib not extending according to the axial direction of the wheel.
12. The device according to Claim 9 or 10 in that it depends on Claim 2, in which the projection (72a) has a straight elongate shape in the run direction of the film, the width and/or the height of the projection preferably increasing in the run direction of the film (F).
13. The device according to Claim 12, in which the projection has a cross section with a flat apex (76) parallel to the bearing surface.
14. The device according to any one of Claims 2 to 10, in which the support is a roller (22; 51a, 51b) mounted so as to rotate, the projection (26a, 26b; 52a, 52b) being arranged on the circumference of the roller.

15. The device according to Claim 14, in which the projection (26a, 26b) is arranged on the circumference of a ring (27), the said ring being mounted on the roller (22).
16. The device according to Claim 15, in which there is a clearance between the ring (27) and the roller (22) taken at ambient temperature, a heating element making it possible to clamp the ring on the roller by expansion.
17. The device according to Claim 14, 15 or 16, in which the bearing surface is defined by the circumference of a second roller (21), the axis of which is parallel to the first roller (22).
18. The device according to Claim 17, in which the first roller (22) has running tracks (28a, 28b) tensioned against the second roller (21).
19. A method for producing at least one scored line in just a first plastic layer (12) of a film (10) comprising at least a second layer (11, 13), the method comprising the production of the scored line in the first layer (12) of the film using a device as defined in any one of Claims 1 to 19.
20. The method according to claim 19, wherein the film is running with respect to the device for producing the scored line.
21. The method according to Claim 19 or 20, in which the scored line is made after assembling the first (12) and second (11, 13) layers of the film.
22. The method according to Claim 19 or 20, in which the said scored line is made before assembling the first (12) and second (11, 13) layers of the film.
23. A method of manufacturing a flexible packaging (400), which may especially be designed to undergo a preservation treatment, from at least one film having a first plastic material layer (12) and at least a

second layer (11, 13), the said second layer forming the outer face of the packaging, which method comprises:

- producing at least one scored line just in the said first layer (12) of the film according to the method defined in any one of Claims 19 to 22, then
- making the packaging from the film provided with said scored line.

24. A film comprising at least one plastic material layer having a scored line, the said plastic material layer forming a bead (55; 75) on its surface along:
 - a single side of the scored line, or
 - on each side of the scored line, one of the said beads being higher than the other of the said beads.
25. The film according to claim 24, wherein the said plastic material layer forms a bead on its surface along each side of the scored line, one of the said beads is at least 30%, preferably at least 50%, more advantageously at least 100%, higher than the other of the said beads.
26. A film comprising at least one plastic material layer having a scored line, the said plastic material layer forming a bead (55; 75) on its surface along each side of the scored line, the cross-sectional area of one of the said beads being greater than the cross-sectional area of the other of the said beads.
27. The film according to claim 26, wherein said cross-sectional area of one of the said beads being at least 30%, preferably at least 50%, more advantageously at least 100%, greater than said cross-sectional area of the other of the said beads.
28. A film comprising at least one plastic material layer having a scored line, the said plastic material layer forming a bead on its surface along each side of the scored line, one of the said beads

providing a higher mechanical resistance to the said plastic material layer with respect to the other of the said beads.

29. A film (10) comprising at least one plastic material layer (12) in which is made:
 - a groove forming a scored line, or possibly
 - a series of perforations where the film comprises at least one other layer,the groove or the perforations being produced without removing material from the said layer (12).
30. A packaging (400), which may especially be designed to undergo a preservation treatment in particular after it has been filled and closed, comprising at least one flexible wall, the said flexible wall comprising a plastic material layer (12) in which is made:
 - a groove forming a scored line, or possibly
 - a series of perforations where the film comprises at least one other layer,the groove or the perforations being produced without removing material from the said layer.
31. The packaging according to Claim 30, in which the groove corresponds to at least one incision.
32. A packaging (400), which may especially be designed to undergo a preservation treatment in particular after it has been filled and closed, comprising at least one flexible wall, the said flexible wall comprising a plastic material layer in which a groove forming a scored line (432) is made, the said plastic material layer forming a bead (55; 75) on its surface along:
 - a single side of the scored line, or
 - on each side of the scored line, one of the said beads being higher than the other of the said beads.

33. The packaging according to claim 32, in which the said plastic material layer forms a bead on its surface along each side of the scored line, one of the said beads being at least 30%, preferably at least 50%, more advantageously at least 100%, higher than the other of the said beads.
34. The packaging according to Claim 32 or 33, in which the bead is made from material which has plastically flowed out of the groove made in the said layer (12).
35. The packaging according to Claim 32, 33 or 34, in which a second groove (433) forming a second scored line is made in the said layer, the second groove extending at some distance along the first groove, in which the single bead (55; 75) or the highest bead of each of the grooves is arranged along the groove on the side away from the other groove, the two scored lines preferably being separated by 2 to 5 millimeters and the two lines preferably also being parallel.
36. A packaging (400), which may especially be designed to undergo a preservation treatment in particular after it has been filled and closed, comprising at least one flexible wall, the said flexible wall comprising a plastic material layer in which a groove forming a scored line (432) is made, the said plastic material layer forming a bead (55; 75) on its surface along each side of the scored line, wherein the cross-sectional area of one of the said beads is greater than the cross-sectional area of the other of the said beads.
37. The packaging according to claim 36, wherein said cross-sectional area of one of the said beads is at least 30%, preferably at least 50%, more advantageously at least 100%, greater than said cross-sectional area of the other of the said beads.

38. The packaging according to Claim 36 or 37, in which the bead is made from material which has plastically flowed out of the groove made in the said layer (12).
39. The packaging according to Claim 36, 37 or 38, in which a second groove (433) forming a second scored line is made in the said layer, the second groove extending at some distance along the first groove, in which the bead of each of the grooves having the greatest of said cross-sectional areas is arranged along the groove on the side away from the other groove, the two scored lines preferably being separated by 2 to 5 millimeters and the two lines preferably also being parallel.
40. A packaging (400), which may especially be designed to undergo a preservation treatment in particular after it has been filled and closed; comprising at least one flexible wall, the said flexible wall comprising a plastic material layer in which a groove forming a scored line (432) is made, the said plastic material layer forming a bead (55; 75) on its surface along each side of the scored line, wherein one of the said beads provides a higher mechanical resistance to the said plastic material layer with respect to the other of the said beads.
41. The packaging according to Claim 40, in which the bead is made from material which has plastically flowed out of the groove made in the said layer (12).
42. The packaging according to Claim 40 or 41, in which a second groove (433) forming a second scored line is made in the said layer, the second groove extending at some distance along the first groove, in which the bead of each of the grooves having the greatest of said cross-sectional areas is arranged along the groove on the side away from the other groove, the two scored lines

preferably being separated by 2 to 5 millimeters and the two lines preferably also being parallel.

43. The packaging according to any one of Claims 30 to 42, in which each scored line is made in the face of the wall towards the inside of the packaging.
44. The packaging according to one of Claims 30 to 43, in which the said plastic material layer is made of polypropylene, the wall preferably also comprising a layer made of a light metal such as aluminum.
45. The packaging according to any one of Claims 30 to 44, comprising a second flexible wall, the first and the second wall being joined by their side edges and preferably comprising welds on the side edges.